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ABSTRACT

This report considers a range of issues involved in doing case-study research with emphasis on the potential for and the problems associated with this approach in distance education. The report begins with an introduction to the case-study research methodology, noting that it is not widely recognized as an approach in distance education. Substantive general issues are identified as ethical issues, problems of validity and reliability, generalizability, and the extent to which case-study research can contribute to the building of theory. Two case studies in distance education are then presented to illustrate different aspects of this type of research, both in the nature of the findings and the theoretical issues involved. The first example looks at the process of developing distance education courses with particular attention to the experience of the Classroom Processes course at Deakin University (Victoria, Australia). The second example is an interview-based evaluation study of the introduction of home computers into an Open University (United Kingdom) second-level course, The Fundamentals of Computing. The more detailed report for the second study covers theoretical perspective; methodology; the types of students (i.e., professionals using computers, students wanting a degree for a job change, women returning to work, students with a general interest in computers, and computer experts); study patterns and coping with the course; and issues of openness and access. The two studies are then compared, and a discussion of the development of theory in distance education concludes the report. (8 references) (DB)

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DISTANCE EDUCATION MASTER OF

RESEARCH IN DISTANCE EDUCATION

CASE-STUDY RESEARCH IN DISTANCE EDUCATION

ALISTAIR MORGAN

IR033341

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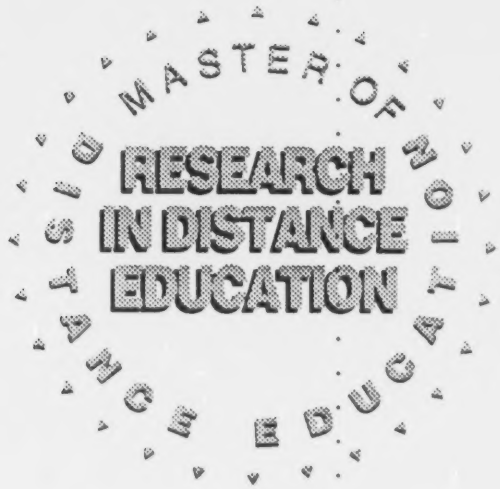

Case-Study Research in Distance Education

Alistair Morgan

Deakin University
University of South Australia

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Alistair Morgan
Dr Alistair Morgan is a Lecturer in the Institute of Educational Technology (IET) at the UK Open University. He was a co-founder of the Study Methods Research Group in IET which is now subsumed within the Student Research Centre in IET. Dr Morgan has published widely on aspects of distance education, especially concerning student learning and qualitative research.

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INTRODUCTION

The aim of this Paper is to consider a range of issues involved in doing case-study research and, particularly, the potential for this approach in distance education and the problems associated with this type of work. Although case-study research is well established in research and evaluation in conventional educational settings, especially school-based classroom research, it is not so widely recognised as an approach in distance education. Consequently, an important aim is to examine the problems and issues in doing case-study research and to assist students who are conducting research projects for the MDEd course. So what do we mean by a case-study approach in research and evaluation? The definition suggested by Walker (1986) provides a valuable starting point:

> Case study is the examination of an instance in action. The study of particular incidents and events, and the selective collection of information on biography, personality, intentions and values, allows the case study worker to capture and portray those elements of a situation that give it meaning. In educational evaluation or research the case study worker may attempt to study and portray the impact in a school of a particular innovation, the experience of a curriculum development team, the development of an idea through a number of social organisations, the influence of a social and professional network, or a day in the life of a teacher, administrator or pupil. These very different studies have in common some commitment to the study and portrayal of the idiosyncratic and the particular as legitimate in themselves. (Walker 1986, pp.189–90)

A case study may employ a wide range of research methodologies, in fact, any technique which seems likely to generate insights into the research questions under investigation. These may include interviews, observations, the study of official documents and the use of questionnaires. In methodological terms, case-study research can be regarded as similar to the approach which been has adopted under the label of 'illuminative evaluation' (Parlett & Hamilton 1977). The aim is to understand 'what is really going' in a complex organisational setting and attempt to make sense of the multiple realities of complex phenomena.

Illuminative evaluation was articulated as an alternative to the 'agricultural–botany' model of educational evaluation which, essentially,

attempted to apply the methods of physical science to measure the efficiency of educational programmes, particularly curriculum innovations. The primary concern of illuminative evaluation is description and interpretation rather than measurement. As Parlett and Hamilton (1977) explain:

> The aims of illuminative evaluation are to study the innovative program; how it operates; how it is influenced by the various school situations in which it is applied; what those directly concerned regard as its advantages and disadvantages; and how students' intellectual tasks and academic experiences are most affected. It attempts to discover and document what it is really like to be participating in the scheme, whether as a teacher or pupil; and in addition, to discern and discuss the innovation's most significant features, recurring concomitants and critical processes. In short, it seeks to address and to illuminate a complex array of questions. (Parlett & Hamilton 1977, p.10)

Illuminative evaluation is not merely concerned with adopting a different set of techniques and methods, compared to traditional evaluation; rather, it is concerned with generating holistic descriptions of complex educational settings which provide an understanding of a particular 'learning milieu'. Parlett and Hamilton have developed the notion of the 'learning milieu' to represent the complex inter-relationship of the cultural, social and organisational phenomena which create a teaching–learning environment. Although this concept was developed in relation to education in conventional settings, it also seems to be a useful way for considering distance education.

In looking at case-study research in distance education, this Paper will discuss some of the key issues by making reference to two studies in which the present author has been closely involved. These two examples each illustrate a different aspect of doing case-study research, both in terms of the nature of the findings and the theoretical issues involved in conducting the studies. The first example looks at the process of developing courses in distance education and, in particular, the experience of the *Classroom Processes* course at Deakin University. (This is *'Classroom Processes*: A case study of course production', chapter 2 in Altrichter, Evans & Morgan 1991, in Part 2 of this Unit.) The second example is an interview-based evaluation study of the introduction of home computers

into an Open University (UK) second-level course, *The Fundamentals of Computing*.

This Paper will serve as a form of 'critical commentary' on these specific examples so as to draw out what seem to be substantive general issues for case-study research in distance education.

Evaluation and research in distance education

In this Paper, it is not intended to draw a major distinction between research and evaluation. The position taken here is essentially the one adopted by Walker 1986, p.192) in that both research and evaluation are conducted in settings which have political dimensions, and although the evaluator may work in a context which is politically more intense, the difference between research and evaluation is not that great.

> This difference between research and evaluation is essentially one of degree, for the researcher too in choosing to respond to the interests and needs of one group rather than another, enters a web of political relationships, perhaps less pressing but just as real as those enclosing the evaluator. Whether we are working as researchers or evaluators we are primarily concerned with the creation, production and communication of knowledge. We enter the political arena because that knowledge is often the basis on which power is legitimated. As researchers and evaluators we are frequently hired by those with power to study those who are powerless; and in the particular case of education, knowledge is not only the basis of power but the medium through which power is exerted. (Walker 1986, p.192)

The variations in power relations in evaluation work have been looked at in more detail by MacDonald (in Hamilton *et al* 1977). He sets out three basic forms of evaluation—unfortunately in gendered terms—and they are *bureaucratic, autocratic* and *democratic:*

> **Bureaucratic evaluation**
> Bureaucratic evaluation is an unconditional service to those government agencies which have major control over allocation of educational resources. The evaluator accepts the values of those who hold office, and offers information which will help them to accomplish their policy objectives. He acts as a management consultant, and his criterion of success is client satisfaction. His techniques of study must be credible to policy makers and not lay then open to public criticism.

He has no independence, no control over the use that is made of his information and no court of appeal. The report is owned by the bureaucracy and lodged in its files. The key concepts of bureaucratic evaluation are 'service', 'utility' and 'efficiency'. Its key justificatory concept is 'the reality of power'.

Autocratic evaluation

Autocratic evaluation is a conditional service to those in government agencies which have major control over the allocation of educational resources. It offers external validation of policy in exchange for compliance with its recommendations. Its values are derived from the evaluator's perceptions of the constitutional and moral obligations of the bureaucracy. He focuses upon issues of educational merit, and acts as expert adviser. His techniques of study must yield scientific proofs, and because his power base is the academic community. His contractual arrangements guarantee non-interference by the client, and he retains ownership of the study. His report is lodged in the files of the bureaucracy, but is also published in academic journals. If his recommendations are rejected, policy is not validated. His court of appeal is the research community, and higher levels of the bureaucracy. The key concepts of the autocratic evaluator are 'principle' and 'objectivity'. Its key justificatory concept is 'the responsibility of office'.

Democratic evaluation

Democratic evaluation is an information service to the community about the characteristics of an educational programme. It recognises value-pluralism and seeks to represent a range of interests in its issue-formulation. The basic value is an informed citizenry, and the evaluator acts as a broker in exchanges of information between different groups. His techniques of data gathering and presentation must be accessible to non-specialist audiences. His main activity is the collection of definitions of and reactions to, the programme. He offers confidentiality to informants and gives them control over his use of the information. The report is non-recommendatory, and the evaluation has no concept of information misuse. The evaluator engages in periodic negotiation of his relations with sponsors and programme participants. The criterion of success is the range of audiences served. The report aspires to 'bestseller' status. The key concepts of democratic evaluation are 'confidentiality', 'negotiation' and 'accessibility'. The key concept is 'the right to know'.

(MacDonald 1977, p.224)

Within this framework of MacDonald (1977), the democratic approach seems to be particularly relevant to case-study research and evaluation. As mentioned earlier, the aim of case-study work is to chart the multiple realities of different interest groups involved in the issue, phenomena or organisation under investigation, in a way which incorporates negotiation of the interpretations with the participants. Although a considerable amount of case-study research in distance education appears to fit most easily into the autocratic style, the way MacDonald outlines the democratic style seems to be a potentially valuable approach in distance education.

To develop this 'critical commentary' on the three research and evaluation studies, this Paper looks at each one in turn to draw out the substantive issues for case-study research. What are the ethical issues? What are the problems of validity and reliability, and also generalisability? To what extent can case-study research contribute to the building of theory?

DEVELOPING COURSES IN DISTANCE EDUCATION

The experience of *Classroom Processes* at Deakin University

In '*Classroom Processes*: A case study of course production' (see chapter 2 in Morgan, Altrichter & Evans 1991), the aim was to attempt to understand the complex organisational milieu in which courses are developed in distance education and, particularly, to address the basic question, 'How did *Classroom Processes* come to be produced?' Although the basic tenet in conducting that case study was to explore the organisational milieu, the way in which issues emerged throughout the study seems important to discuss further.

Making sense of the departmental setting within Deakin University, namely, the School of Education, turned out to be more complicated than had been initially envisaged. Not only were there the 'normal' academic controversies associated with the educational and social sciences, but another 'layer' of controversy derived from the history of the School and the development of the new university. The reporting of this sort of

controversial material will always pose difficult problems in case-study research. How can contradictory and controversial material be reported? In the *Classroom Processes* case-study, working in the democratic mode, a draft report was circulated to all informants to comment on the interpretations I was making. Subsequent negotiation resulted in some changes where the emphasis was considered to be incorrect or 'distorted'. Although there were complex multiple realities to document, the aim in writing the case study was to portray the crucial areas of controversy in a sensitive manner, without producing an account, whilst acceptable to all parties involved, which only tangentially addressed the key issues.

In considering the characteristics of case studies in general terms, the questions posed by Walker provide a useful reference point for both analysing and conducting case-study research.

> To whose needs and interest does the research respond?
> Who owns the data (the researcher, the subject, the sponsor...?)
> Who has access to the data? (who is excluded or denied?)
> What is the status of the researcher's interpretations of events vis à vis the interpretations made by others? (who decides who tells the truth?)
> What obligations does the researcher owe to: his subjects, his sponsors, his fellow professionals, others?
> Who is the research for?
>
> (Walker 1986, p.187)

These questions provide a framework for some of the crucial issues underlying case-study research.

So far, there has been little discussion of *reliability* and *validity*. How do these concepts apply to case-study research? Although case-study research can be regarded as within a different paradigm from traditional evaluation (and pychometric educational research), the notion of *reliability* seems quite similar. Put simply, that notion is: would a different research worker arrive at essentially the same conclusions when investigating the same case? (The parallel here with empiricist research would be *replicability*.) By focusing on the documentation of 'what is going on' and the charting of multiple realities in any given setting, with the interpretations negotiated with the informants, it should be possible to conduct case studies in a manner which have a high reliability.

In terms of *validity* the crucial issue is one of *face validity*. Does the piece of research portray a sense of reality of the phenomena or case in

question? Does the account have a 'ring of truth' to individuals who have been involved in the subject of investigation? Finally, in suggesting that case-study research by its nature will be of high validity, it can be argued that a powerful check on reliability is whether the study presents a 'recognisable reality' to the reader.

To complete this stage of the commentary on the *Classroom Processes* case study in terms of *validity*, comments from readers of a draft report seemed to confirm that, indeed, there was clearly a recognisable reality in the account. Comments at this stage also suggested that the insights documented did contribute to knowledge in the field of understanding course production in distance education.

Evaluating home computing in distance education

The Home Computing Evaluation Project in the Open University was based on a case study of one course, *The Fundamentals of Computing* (course code M205; see Morgan 1989). This was the first course to require the use of a home computer by students. The aim of the *Computing* case study was to find out what students' experiences of study were really like on a course which required a home computer. The study can be regarded as a case study of the introduction of new technology in distance education. It was carried out through individual face-to-face interviews with students in their homes; methodologically, it was one of the few in-depth interview studies in the overall Home Computing Project, in contrast to the more traditional approach of self-completion postal questionnaires with predominantly pre-coded items. (This can be regarded as the dominant approach to evaluation in the Open University—see Morgan 1990.) For this Paper, some of the main sections of the original case study report are reproduced in the next section so as to provide the background for the critical commentary on case-study research.

STUDENTS' EXPERIENCES OF STUDY: *THE FUNDAMENTALS OF COMPUTING*

Introduction

How does the introduction of home computing in the Open University influence the way students go about their studies? The aim of the qualitative research in the overall evaluation project is to generate insights into students' experiences of study. Besides the details of how the course has been received in the first year, that is, the formative evaluation aspects of the project, what are the more general issues of home computers in OU distance education? What are the issues of access and inequality associated with home computers? What are the influences on students' study patterns? The aim of the qualitative research is to provide an holistic picture of how students are going about study and to put a unique perspective to the other studies in the overall evaluation project. This perspective will also contribute to developing theories of student learning in the Open University.

Theoretical perspectives

The research approach is in the qualitative–illuminative tradition and aims to find out 'what is really going on' from the students' perspective. In understanding the students' experience, this research draws on the theoretical framework developed from phenomenological studies of learning in *The Experience of Learning* edited by Marton, Entwistle and Hounsell (1984), and particularly the concept of 'orientation to study'. *Orientation* describes a student's aims, values and purposes in study, that is, the nature of the relationship between a student and a course: a sort of holistic motivation. (This is not referring to motivation in the mechanistic sense in which a student is pushed or pulled by external factors.)

Orientation provides the broad 'backcloth' for understanding how and why a student tackles their work in a particular way. The main variations in orientation to study are academic, vocational and personal, with distinctions of intrinsic and extrinsic in each category. So, for example, a *vocational extrinsic orientation* is concerned with obtaining a qualification, whereas a *vocational intrinsic orientation* is concerned with the content of a course needed for a particular job. An *academic intrinsic orientation* concerns a student's study for interest in the subject, in contrast to an

academic extrinsic orientation where taking a course just 'happened' to the student as the next step on the 'educational ladder'. (This orientation does not really apply to OU students, although it is prevalent with conventional, that is, younger age undergraduates.) A *personal intrinsic orientation* is concerned with personal growth and development through study, in contrast to a *personal extrinsic orientation* where students are concerned with proof of capability to themselves and their peers.

This theoretical framework provides the basis for interpreting how a student tackles a course or a particular part of it. Students' study patterns will be influenced by what they want to gain from a course. This basis for interpretation forms an important part of the qualitative analysis. Students' descriptions of their experiences of study can be developed into a typology which provides more general statements about student learning, but at the same time retaining the holistic description of the learner. This is the unique feature of qualitative research using individual depth-interviews.

Methodology

In choosing a sample of students to interview, there are a number of issues to be balanced. Clearly, with a sample of about twenty, there will no claim for statistical representativeness, however, the aim is to adopt a strategy of theoretical sampling. In this approach, data collection and analysis proceed together and new cases to study are selected according to their potential for refining and developing the emerging themes and concepts. In spite of this, a starting point is needed when there are over two thousand students on the course throughout the country. The key issues to balance are, for example: educational background, gender, regional location, class, occupation, experience of OU study, etcetera. From other studies of home computing in the OU, there was also a view that this *Computing* case study should not be located in the Southeast of England because of the regional concentration of wealth, and also because a large number of students in this area are middle-class male computer professionals. In the planning stage of this project there was some interest in looking at students in the 'more remote' areas, although issues of distance and remoteness are complex and ambiguous, particularly in the context of electronic mail and computer conferencing. Taking all these factors into account, it was decided to focus on students at the Open

University in Wales, as Wales would most likely provide quite a diverse range of students. Also there are some aspects of remoteness geographically, culturally and, probably economically from the dominant forces in society in the south east of England. Eventually, sixteen students from the Open University in Wales were interviewed.

Who are the students?

In the section above, the concept of *orientation to study* was introduced as a way of understanding how students come to be engaged in OU study. This concept provides a basis for making sense of how students come to be taking the particular course, *The Fundamentals of Computing*. Another important factor is the issue of change in students' lives, in personal and domestic terms and also in career terms. There are two aspects of 'career' to consider. Firstly, the career of the student engaged in study in the undergraduate program and progress towards a degree and, secondly, the career of the student in work and employment terms. There is a continuous interaction or dialectic between these two aspects of career and this interaction has a crucial influence on students' choices and decisions about how and why they study. This background understanding of students' overall context for study provides a 'foundation' in the *Computing* case study for addressing the basic research question 'Does home computing work?'

Although there are numerous differences between students, it is possible to represent them by means of a relatively small number of major variations or distinct 'types'. The present study suggests a typology describing five major variations as follows: (1) professionals using computers in their work; (2) students wanting a degree for a job change; (3) women returning to work; (4) students with a general interest in computers; and (5) computer professionals. These five, somewhat idealised, 'types' provide a way of understanding how students tackle their OU study and cope with the home computer.

Professionals using computers

There was a distinctive group of students who were engaged in a range of professions, but who all used computers to some extent to assist their work. For these students one their aims in studying the course was 'to get to know a bit more about computers'. Four students were clearly in this category, although their areas of work were diverse—including, for

example, geological research consultancy, production management in the food industry and water resource management—they all used computers as part of their work. Studying *Fundamentals of Computing* would help them with their work, but only in a fairly general manner; maths and computing were also personal interests which had developed from the content of their work. These students were in senior positions in their work careers, and although their formal educational backgrounds were at Higher National Certificate (HNC) or Higher National Diploma (HND) level, their work experience and seniority were now more important in career terms than getting a degree. They had considerable background knowledge in computers, but were not necessarily experienced in PASCAL.

For example, as a student working in the industry explained:

> *I use a bit of maths in our work on sludge treatment and I got interested in maths ... It was a personal interest initially, so I decided to do it properly and I took the Maths Foundation Course. I probably won't use it really, but we do use some maths in the work on water treatment—we work with engineers—on site meetings it is nice to know more of what is involved, rather than just taking what they say as experts.*

This student was then in his second year of OU study, his interest in M205 was, again, a general one stemming from some of his work activities.

Another student had applied computers to cartography in an innovative way and had gained promotion in his organisation to head of department; in career terms, he was clearly very successful. But it was personal interest which attracted him to OU study as he explained:

> *I wanted some mental stimulation—I've got a son at university—a colleague in the finance department here has just got a maths degree; I've got friends doing OU study and I have seen some of the TV programmes—so I put in to the company to do a degree. I did* [Technology Foundation Course] *T101 and thoroughly enjoyed it—it was really stimulating, although toward the end it was a bit of a struggle.*

Later in the interview, he talked about how he was finding M205:

> *I wanted to know more about computers, background knowledge to understand more about the system here (in his workplace), rather than the programming—I've got PASCAL programmers upstairs!*

In spite of this comment about the course content, he assumed it would:

> *... all fall into place eventually ... I'm doing it for the stimulus—its coming to be a bit of a chore doing the TMAs, but it's great really—it's a pretty good course.*

In relation to *orientation to study*, these students can be understood in terms of a combination of academic and vocational intrinsic orientations. It is the intrinsic nature of these orientations which is a key feature of this idealised 'type' of student. Although they are professionals using computers and they want to improve their understanding of computers, OU study seems unlikely to be very important to them in terms of career progression.

Students wanting a degree for a job change

There was another group of students who wanted an OU degree to help them with a change of job or specific career promotion. Six students all had some background in postcompulsory education and in some cases had qualifications to HND level. The key feature of these students is that their prime reason for OU study is to get a qualification in order to change jobs.

For example, one student had left school, gone to technical college and was working as a panel beater. He was in his late twenties and appeared to be fairly comfortable in a material sense, but he wanted a change. He wanted to get a degree as quickly as possible and was aiming to do one-and-a-half credits per year.

> *I am trying to change jobs and I want a degree ... I want a computer-oriented job. I've looked at things in administration, but they are poorly paid—working with my hands pays better at the moment.*

He certainly wanted a degree, as he explained, 'Daddy was right, I should have stayed at school and gone to college and got some qualifications.'

In terms of orientation to study, a *vocational extrinsic orientation* would describe this student. A similar case is a student in his early twenties working as a marine engineer doing M205 as his second course, after the *Maths Foundation Course*.

> *I'd always wanted to get a degree, but wanted some cash—so I left school after A-level and did an apprenticeship and an* [Ordinary National

> Diploma] *OND and HND in marine engineering from part-time study. As a marine engineer you're a jack of all trades—practical engineering knowledge, computer work and control, etcetera. I wanted a degree and was interested in computers at school ... I'd played around in BASIC but I thought it was time I learnt about it properly—so I'm doing M205.*

His work schedules, which involved long periods at sea, made keeping up with OU work difficult; he was always very short of time and he spent most of his leave studying. In spite of these problems, he was determined to succeed:

> *I'll get there in the end—I've done two years now and I won't give up—on leave, my life is the degree, compared to friends who just seem to waste time—I'll get the Ordinary Degree and the time pressure will be off—and I'll get a better paid job sorted out.'*

Within this group, two students had gained the promotion they wanted before graduation and this had a considerable influence on their studies. The very strong interest to get a degree as a route to a better job sometimes changed quite dramatically. For example, one student had left school then done an HNC in production engineering, but he wanted a change of job.

> *I want to get a degree whilst working—there's not much cash in repairing aircraft, so I started on T101 then did* [Maths Foundation Course] *M101 and now M205 this year. I've just got a new job as a technical sales executive, so the degree is less important now.*

He commented how the pay in his new job was very good and that any change now might be toward technical sales in computers, as he gained more knowledge from his OU studies. It seemed clear that he had already succeeded in changing jobs before he had completed his undergraduate studies.

The phenomenon of job change and promotion during study sometimes resulted in dropout, as a production manager (about 40 years old) explained:

> *I've always wanted to go to university and get a degree but I left school and did an HNC part-time. I've done T101, TM222* [The Digital Computer] *and TM281* [Modelling by Mathematics]*—but some of the rush has gone out of it now—I've been promoted. It's experience that counts now—I was*

doing an assignment one weekend, the family was round the house and I just thought, 'What am I doing?'—my priorities have changed really—I'm about to dropout now—perhaps I'll come back later when the children are older.

These examples can be seen as the paradigm case of *change* in orientation to study. There were other less 'extreme' cases of change: for example, teachers moving from physical sciences into computing, in response to job vacancies and chances of promotion, and also, students taking early retirement, but aiming to add computing knowledge to their existing expertise, in order to give them a chance of a 'second career', or some part-time work in the future.

The importance of change in career is that it can have a crucial impact on how a student tackles the course, that is, the interaction between the 'lines' of career as a student and career in the workplace. This overall social context of study is important to understand when interpreting how and why students tackle their work.

Women returning to work

Women returning to work, or planning to in the future, seem to form a distinctive group within the student population. The style of OU home-based study suits these students. For example, as a student in her early twenties with a two-month-old baby commented:

I'm not wanting a career in computing at the moment, that is for the future—I just love computing!—I always liked the logic of working things out—that's the main beauty of it all. It's brilliant to have the computer all the time—it's really marvellous to get all the education I want, it really suits me.

In terms of *orientation to study, vocational* and *academic intrinsic* seem to describe this student.

In another case, the aim of OU study was to update previous qualifications and experience so as to compete in the job market.

I've worked in computers for ICL eight years ago, before I had the children—I was working part-time until last year—I needed to prove I was up-to-date in computers, especially as I have no formal qualifications in computing—so I started with the OU on M101—It was the only thing around here, then I did TM222. I got a fulltime job this year teaching computing at the local technical college—I've got a job now so it's a bit different—but I still want the computer qualification, although I have much less time now.

Students with a general interest in computers

There were three students who described their interest in the course in very general terms such as, 'computers are going to be very important in work' or, 'it's about time I knew more about computers'. In terms of orientation to study it could perhaps be seen as *academic* and /or *vocational intrinsic orientation*. However, a key feature of these students was the vagueness of their interest and also, they were all novices at programming. In fact, these students appeared to be on the point of dropping out when they were interviewed (in mid-year).

For example, a student in his twenties had left school with one A-level and was working in a local factory. He had done M101 and *The Science Foundation Course* (S101) and also dropped out of two other courses.

> *I thought M205 would be interesting and about computers—I've messed about in BASIC—I've got a sort of hobbyist interest in computers. I've found the course very difficult—I've been working weekends and have not had much time for it—I've missed the last two TMAs so I'll probably dropout.*

Although he put his difficulties down to lack of time, he seemed to be somehow 'disconnected' in his OU study in the sense that it lacked a clear focus, other than a vague hobby interest in computers.

Other students seemed to want a broad general course on computers and were surprised at the amount of programming required. It seemed that their interest in the course was not sufficient for them 'to stick at' the programming which is required for the TMAs, which is quite a task for students new to programming. They were considerably behind with the course and again, thought they were likely to dropout.

Computer experts

There seemed to be one other distinctive group of students within this typology, namely, computer experts: they use computers regularly and are experienced programmers. Although only one student in the present study was clearly of this type, from other knowledge of the student population, it seems useful to describe this as a category.

For example, a student described himself as an academic who had moved into computers; he was a self-employed consultant working on the application of computers to linguistics, as he explained:

> *I'm interested in the course to be more in control of computers through understanding more about them. It is not going to affect my work—I've got enough consultancy to keep me going for the rest of my life—a personal interest in computers and eventually to get an OU degree with a computer profile, but more degrees is the last thing I really need. I could have tutored the course really and not done it (as a student), but I didn't really know in advance—but it's a good course.*

The interest in the course may not be very different from other student's in terms of orientation to study, namely, *vocational* and *personal intrinsic orientations*. However, from the nature of the student's work, a computer expert, the response to the course is much more critical both in relation to content and pedagogy.

Commentary on this typology

This typology derived from students interviewed in the *Computing* case study is probably not the only which could have been developed. For example, some students are not directly represented, namely, unemployed students, younger students in need of qualifications to get a job, and students from ethnic minority groups. However, the key question is, 'Does this framework provide a useful way for understanding students?' Does it portray a 'ring of truth' about students and a recognisable reality? 'Can we use this framework to understand the present students, and also to reflect more widely on OU students and home computing in distance education?' The aim is to provide holistic descriptions of students from which the key themes and issues of using home computers can be drawn out.

Emerging themes and issues

The analysis of the interviews suggests a number of critical issues for how students cope with studying M205 and, particularly, the home computing activities. These critical issues are closely linked to how students come to be taking the course, that is, their orientation to study and how they 'fit' into the above typology. These issues can be described under five broad headings: (1) getting going; (2) getting 'unstuck' and tutorial assistance; (3) study patterns, and coping with the course; (4) issues of access and openness; and (5) interactions of home computing on the domestic environment.

For this Paper on case-study research, two of these areas will be described in full, that is, study patterns and coping with the course, and issues of openness and access. These two have been chosen as they are useful to illustrate the way in which case-study research can contribute to theory building.

Study patterns and coping with the course

How do students cope with M205? From many of the interviews, the overwhelming impression was 'with difficulty'. For the students who are surviving the course, they seem to have adopted particular ways of tackling their work, depending on their backgrounds and what they want to gain from OU study.

All the students interviewed commented and sometimes complained about the vast amount of time needed to do the course. A number of factors contribute to this. By the nature of the practical computing activities and the TMAs, students can spend very long periods both to get correct solutions and to get 'unstuck'. Adapting to these time demands is one of the crucial issues for students in developing their study patterns.

> *In the first units, I was really pressed at the start—I spent hours and hours—there are practical sessions sprinkled about in the units—you're moving from desk to computer and back doing them all, then the TMA—It was almost like working fulltime, I certainly would have dropped out if I still had a regular job—I was getting so far behind, I'd try something different... I decided to look through the units for the disk introductions and each programme with an answer—I'd work back from the answer sheet and then try the TMA—doing this I got back on schedule.*

He described his change in study pattern to what he called 'his T101 approach' (from his previous course), namely, look at the introductions, then the conclusions and then start the TMA.

A change in study pattern was a key feature of how many students handled the course; this was particularly important when students were in early stages of their OU careers. For example, a confident, experienced student doing his fourth credit described his 'game plan' for coping with the course as follows:

I've got my game plan—there doesn't seem to be time allocated to do the TMAs so you get behind—so now I plough through the text, omit the practicals, then start the TMA, and fill in the bits for the answer—for the exam, I'll concentrate on the parts I know well—you can always leave out sections.

This student, a senior professional using computers in his work, seems to have developed a strategic and instrumental approach to the course. It could be described as a 'TMA aware strategy', or perhaps TMA dominated.

Linked closely to the time factor for studying the course is the content and how it relates to students' aims and purposes. Some students were surprised at the amount of programming demanded by the course. This was an important issue for the 'general issues' students who were also novice programmers and were finding the course a chore, and wondering, 'Is it worth it?' This, again, is an example of the interactions of students' career lines and their work and personal contexts.

Issues of openness and access

What is the impact of home computers for access and openness in the OU study? Do they serve a liberating function to get away from study centre terminals and summer schools? Or do they make OU study more difficult—constraining access and reducing flexibility?

The study time demanded by the nature of the course has been outlined above. Besides the amount of time, the course seems to require this time to be used on long study sessions. Students with a range of backgrounds and interests talked about this.

If you are doing a session on the computer it takes a while to get back into the way of thinking in the evening after work—you can't do it in small time sessions, you need a good length of time.

A number of students who were using computers at work, tended to fit OU study into their worktime, with their work, however, they found this more difficult with M205.

You can read the units and make notes and squeeze it into company time, but with M205 you can't snatch time the same way—you need the computer—

it's more limiting than in the past—you can't read and study anywhere at anytime—you need the machine.

The structure and demands of the course for home computing seem to have 'hidden assumptions' about how OU students work. The assumptions are that students have a regular place of study, that they have a regular place and time of study, and also that they have large spells of time available for OU work. Clearly, the computer imposes some of these constraints, but the course structure and the learning activities seem to reinforce it. The reduced options for flexibility for study can have a significant impact on women students.

For example, a woman doing an OU degree so as to return to work commented:

I always spend one evening a week babysitting for a friend; that used to be a great time for study—I had the whole evening, but you need the computer now. I borrow a machine at the weekends, but small snatches of time don't seem to work on this course—I am working and looking after the family.

Partly to overcome this problem, she used other textbooks on PASCAL which reproduced all the printout in the text. She found it more flexible to use: 'You can take it away with you anywhere—it's much better.'

The demands of studying with the home computer as well as the course content—as they are both structured in M205—appear to reduce openness and flexibility of OU study for a large number of students, and these constraints can be particularly problematic for women. The home computer is preferable to using study centre terminals in respect of these constraints, but the structure and design of the teaching, with the hidden assumptions discussed above, reduce openness and flexibility for study.

Summary and conclusions

How can these research findings serve to inform practice in OU teaching and learning? The aim is to raise the awareness of what it is 'really like' from the students' perspectives to be engaged in OU study with a home computer. There is not a simple question to answer, such as, 'Does home computing work?' There are some gains but also some losses in what we offer to students. As well, this research does not generate neat prescriptions which can be implemented; rather, it serves to highlight the

critical issues of students' experiences of study. These critical issues can be summarised briefly under five broad areas:

1 The students are a very diverse group: the above typology sets out the types of things students want to gain from OU study and how these interact with the course.

2 The demands of the structure of the course result in a reduction of openness for many students. There seems to be 'hidden assumptions' about the nature of students and the time and place they have available for study. (This issue would not apply in the same way to housebound disabled students.)

3 Students seem to need almost continuous access to the computer; students who have arranged to borrow machines so as to reduce costs of OU study are disadvantaged.

4 The content of the course adds another dimension to the 'social dynamics' of the face-to-face tutorial sessions, as well as how the less experienced and less confident cope in the male, computer-expert dominated tutorials.

5 Students have to develop their study patterns beyond narrow course-focused and serialist approaches which many gain from a foundation course. They need the confidence to be selective and become more TMA aware—they have to develop as learners.

In conclusion, the findings gained from the *Computing* case study serve to increase awareness of the student experience. Some of the issues raised can feed into course team discussions about changes to the course presentation and advice to students. At a more general level, the critical issues for home computing in M205 can inform the use of home computers more widely, and also contribute to theory building about student learning in distance education.

Commentary on the evaluation of the *Fundamentals of Computing*

This evaluation case study is very different from the first example, *Classroom Processes*, in a number of ways. First, it was part of an evaluation project which the Open University had contracted to carry out as a condition of the government resources provided for the computers.

Although the evaluation was required by the Department of Trade and Industry, the Open University and the Institute of Educational Technology had professional control over how the evaluation was conducted. Although there was an element of a 'commissioning' body, this did not feel particularly constraining in how the interview-based study was conducted. (Other studies within the overall project did make reference to 'what the University' wanted from the evaluation, and seemed more constrained, but there was no direct control or intervention.)

In terms of the variations in styles of evaluation set out by MacDonald, the study of home computing in M205 is more within the autocratic approach. Although the final report was made available to the informants, there was no opportunity for students to discuss or contest the interpretations which were made by the author through the draft report. So, in this respect, the study was a more conventional qualitative research study, than that of *Classroom Processes*. In contrast, a more democratic approach would have involved students commenting on the way their experiences were being documented by asking them to comment on sections of draft reports or by follow-up on their opinions by telephone calls.

So how did the draft report come to be produced? What process was adopted for the data analysis? And how did the typology for describing the student population emerge?

One of the key issues is that the data analysis commenced as soon as fieldwork was underway. This involved reading and re-reading of the interview fieldnotes, with a 'standing back' from the data asking questions such as, 'What is really going on for this student?' 'What do they want from OU study?' and 'How are they coping with the course?' Simple procedures, such as using a highlighting pen, can identify the key sections from the fieldnotes which can then be copied and transferred onto index cards for further analysis. In the process of working on the data, the aim is to 'bracket' existing preconceptions of what one expects to find, whilst at the same time recognising that what is identified as 'significant' in the data is culturally and experientially influenced.

In the typology of students, some of the categories were to be anticipated from other studies of OU student learning. However, the group of students called 'professionals using computers' was somewhat unexpected. The orientations of these students were a combination of

vocation and *academic intrinsic orientations*: although they used computers in their work, due to their seniority within their work organisations, they did not really need the detailed programming knowledge which formed the pedagogic structure for learning about computers in the course.

One of the interesting themes to merge from this data analysis was the problem of access and openness for students. Some of the issues of inequality and gender relations to new technology were to be expected from other studies. However, what was surprising was the way in which the demand of the course structure assumes that students had continuous access to the computer at home when they were studying. A sort of 'hidden assumption' has emerged in the structuring of the course that students have ideal settings in which to study, settings which are similar to those of the course writers, namely, a study with desk and the home computer available, as well as having quite long time periods for tackling their OU studies. Those students without these ideal study settings were disadvantaged. This reduction of openness for some groups of students is also directly linked to the way home computing was introduced into the course.

In methodological terms for carrying out case-study evaluation research, it seems unlikely that these insights would have been generated from other methods. The issues may well have been recorded in open-ended comments in questionnaires but without the detailed knowledge of students' contexts, it would probably not been possible to make this more substantial analysis, highlighting a key issue.

In terms of *reliability* and *validity*, it has already been pointed out that there are considerable problems with deciding what student population to use as informants. The notion of theoretical sampling was referred to as the alternative to seeking representativeness. It has been discussed in commenting on the typology that some groups of students are not represented in the sample, particularly unemployed and ethnic minorities. This is a weakness of the study. With more time, the approach of theoretical sampling would have specifically set out to locate these groups because they are important for understanding issues of equity and access to the University. However, in spite of this problem, many of the issues identified about study problems would seem likely to be relevant to students with more disadvantaged backgrounds. By bringing these critical

factors into the foreground, reflection on practice is more likely to have a beneficial effect on access.

Does the study present a 'recognisable reality' of home computing on M205? Certainly members of the course team considered the insights useful and interesting. Not surprisingly, they were quite defensive, suggesting that the report only highlighted the negative features and the problems were not as severe as presented. This may be the case, but other studies focusing on quantitative aspects indicate that a considerable number of students had difficulties. The unique contribution of the *Computing* case study is that it focuses on the nature of student study problems. It starts to understand the way in which, in relation to their study patterns, students have problems. Coping with the course demands a study strategy, or 'game plan' as one student called it. In this case, developing a strategy was especially crucial, since it was almost impossible for novice students to cope with the course in the way in was structured. Finding out how to cope with a course seems to be an important general issue for understanding student learning in distance education.

DEVELOPING THEORY IN DISTANCE EDUCATION

Can case-study research of the sort referred to in this Paper contribute to theory? If so, what are the key concepts which form the basis of these theories? Controversies regarding the possibility of theory in research in education have been an ongoing feature in classroom research and evaluation studies for decades. Some writers have been especially critical of case-study researchers, both methodologically and in relation to generalisability and theory development. In considering distance education, it seems important to take account of debates which have been conducted around research in more conventional educational settings.

On methodology, Atkinson and Delamont (1986) are critical of the case-study approach in that it is framed in oppositional terms as a counter to positivism, rather than detailed articulations of any case-study methodology. They are hostile to the eclecticism and to the notion that

fieldwork in a school-based evaluation, for example, could be condensed into a short period of time. They are also hostile to the notion that adopting a sort of ethnographic approach was done in a manner which did not justice to ethnography. Atkinson and Delamont commented:

> It is our contention that the case study research tradition is seriously deficient due to its both inadequate methodology and a lack of methodological
> self-awareness. The methodological self-awareness we are referring to here would not imply a radical doubt over the essential purpose and value of ethnographic work. On the contrary, it would recognise its value and importance even more. It would treat methods seriously, rather than adopting the essentially philistine attitude that 'anyone can do it'. (Atkinson & Delamont 1986, p.244)

It seems reasonable that these writers should object to 'low quality' research and evaluation. However, to dismiss case-study research because it is conducted in the everyday language of informants (the democratic style to evaluation), rather than in the esoteric language of the academic researcher seems unhelpful and even misguided. The contention here is that the two examples of case-study research in distance education are 'rigorous' studies in their own right. This is not to suggest that, with hindsight, they might have been conducted differently, or perhaps in superior manner. But just because they did not involve fieldwork conducted over a long period of time, does not mean 'anything goes', and that these studies were not methodologically 'self-aware'.

The criticisms regarding theory generation are also pertinent, particularly when theory in research and evaluation in distance education has not really progressed very far, or been seen as a particularly urgent field of inquiry. The criticisms of Atkinson and Delamont are based on the notion that illuminative evaluation or case-study research only pay attention to specific instances and that there is an absence of comparative analysis. As they comment:

> In fact the development of ethnographic work in sociology and anthropology rests on the principle of comparative analysis. If studies are not explicitly developed into more general frameworks, then they will be doomed to remain isolated one-off affairs, with no sense of cumulative knowledge or developing theoretical insight. Regrettably, this failing of 'illuminators' renders their work a rather pale version of

> qualitative research. This is particularly noticeable in the extent to which their focus remains fixed on the particular research setting, with little attention to other educational settings, and practically none to social settings of other sorts. (Atkinson & Delamont 1986, p.249)

The assertion that cumulative knowledge is important if theories and concepts are going to be developed is a crucial point. However, to dismiss illuminative evaluation and case-study research as being little more than a series of 'one-off' self-contained reports seems be short-sighted and incorrect. For instance, the work of Malcolm Parlett has developed the notion of the 'learning milieu' and he has used this concept to understand a wide range of teaching–learning situations and organisations.

In terms of theory development, Hammersley (1990) raises similar questions about ethnography in the sociology of education and calls for complementarity in research studies:

> What we have here, then, are three pieces of ethnographic work which, in a limited way at least, build upon one another, developing and testing a particular theory. We look in vain for other examples of such complementarity in the sociology of education, and there are not many in sociology generally. The tendency has been for studies to investigate a diverse range of phenomena, their authors moving from one topic to another, with few attempts to captilise on earlier work. Yet unless researchers work collectively on particular theories, investigating cases which are critical for those theories, there will be no cumulative devlopment of knowledge. (Hammersley 1990, p.11)

The *Classroom Processes* case study and the *Computing* case study have both attempted to be theoretically 'conscious'. In looking at the development of courses in distance education, the case study of *Classroom Processes* attempts to locate the organisational and academic hostilities within a broader framework of the politics and subcultures of complex organisations. As well as describing the detail of the single setting, the findings are relevant to contemporary studies in business organisations. Although it might be assumed that successful business organisations operate efficient. rational, systems-approaches to strategic planning, the work of Pettigrew (1985) identified that the content of strategic change was ultimately the product of a legitimation process shaped by political and cultural considerations. The *Classroom Processes* case study highlighted

the political/cultural process of contestation. It also located these processes as modifying and extending the conventional view of educational technology which portrays a rational, systems-approach to course development.

The evaluation study of the *Fundamentals of Computing* specifically set out to be more than a 'one-off' study of a single course in a single region. By using the concept of *orientation to study* as a 'backcloth' for making sense of how students were tackling the course, the aim was to further articulate what could be termed a theory of 'orientation–approach to study' in distance education. Besides the details of how the home computer was used, the study highlighted the strategic nature of distance education and the almost necessary requirement to 'suss out' a sort of game plan for tackling a course. It seems that a certain degree of 'TMA-awareness' study (possibly even instrumentalism) in distance education is a crucial factor for success, and that with the absence of an immediate peer group, this process of development can be problematic.

I have maintained in this Paper that case-study research can serve to build up and develop concepts and theories, yet the criticism that case-study evaluations can often be little more than 'one-off affairs' is a salutory remark. It is hoped that criticism will encourage comparative studies relating to, and extending earlier work in order to build up a stronger theoretical understanding of distance education. The case study examples presented in this Paper are, I believe, a step in the right direction.

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